DIVISION 11 – EQUIPMENT

SECTION 11310

PREFABRICATED FRP AIR STRIPPER INFLUENT AND EFFLUENT LIFT STATIONS

PART 1 – GENERAL

1. DESCRIPTION

A. Scope of Work

1. Contractor shall furnish all labor, materials, equipment and performance of all work necessary or incidental to furnish and install two duplex prefabricated fiberglass reinforced polyester (FRP) lift stations. The lift stations shall each be a completely factory-assembled unit, requiring only minor adjustments and reassembly in the field. Attached at the end of this section is a list of materials and drawings for the new Air Stripper Effluent Pump Station provided by the specified manufacturer showing required equipment items and demonstrating the quality standard for both pump station. The new Air Stripper Influent Pump Station shall be similar to the new Air Stripper Effluent Pump Station list of materials and drawings at the end of this section except for the piping size and orientation and other details as shown on the contract drawings.

B. Quality Assurance

1. Qualifications of Manufacturer

   a. The manufacturer shall demonstrate the ability to fabricate the various lift station components, as shown in the plans and as specified herein, utilizing adequate number of skilled workmen, equipment, tools, facilities, and subcontractors. Each complete lift station shall be manufactured by Topp Industries, Inc. or pre-approved equal.

2. Referenced Standards

   a. ASTM A36 (Latest Revision): Standard Specification for Structural Steel.

   b. ASTM A283D (Latest Revision): Standard Specification for Structural Steel.

   c. ASTM D883 (Latest Revision): Definitions of Terms Relating to Plastics.

   d. ASTM D3753 (Latest Revision): Standard Specification for Glass-Fiber-Reinforced Polyester Manholes.

e. ANSI B16.1 (Latest Revision): Standard Specification for 125 lb. Standard Flat Face Cast Iron Flanges.

C. Submittals

1. Shop Drawings and Manufacturer's Literature: The prefabricated FRP lift station manufacturer shall prepare shop drawings for each complete lift station including structural and opening details, equipment mounting and location details, and manufacturer's cut sheets for each item of equipment in the lift station. The main component of the submittals shall be an 8½" x 11" drawing of the complete prefabricated FRP lift stations prepared by the manufacturer. Manufacturer's cut sheets shall indicate capacities, dimensions, and materials of construction for all equipment in the prefabricated FRP lift station. The supplier shall verify that the all submerged components shall be suitable for contact with landfill leachate.

D. Operating and Maintenance Manuals

1. The prefabricated FRP lift station supplier shall prepare a complete operations and maintenance (O&M) manual for each complete lift station. The O&M manual shall include routing maintenance requirements and spare parts lists for each major item of equipment in each lift station. The names and telephone numbers of companies where spare parts and/or trained service technicians are available shall also be included for each item of equipment

E. Delivery and Handling

1. Conditions for Delivery and Handling:

a. The manufacturer of the prefabricated FRP lift stations shall coordinate with the contractor so that each lift station is delivered to the jobsite on time for installation. Handling instructions shall be provided by the lift station manufacturer with the lift station to insure proper handling of the lift station structure. After delivery to the jobsite, the contractor shall store the motor control panels off the ground in a dry location until it is mounted and supplied with electrical service. The contractor shall also insure that all pump power and control cables, as well as transducer cables are protected from submergence until they are properly installed and sealed.

F. Guarantee

1. The prefabricated FRP lift station manufacturer shall guarantee each complete prefabricated FRP lift station to be free from defects in materials and workmanship for a period of one year from the date of start-up and acceptance.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Fiberglass Reinforced Polyester Wet Well (and Integral Valve Box): Unless otherwise indicated the plastic terminology used in this specification shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) designations D883 - Definitions of Terms Relating to Plastics.

B. Resins:

1. The resins used shall be commercial grade polyester and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the intended environment. The resins used may contain the minimum amount of fillers or additives required to improve handling properties. Up to 5% by weight of thixotropic agent, which will not interfere with visual inspection, may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between manufacturer and engineer, recognizing that such additives may interfere with visual inspection of FRP laminate quality.

C. Reinforced Material

1. The reinforcing material shall be a commercial grade of glass fiber (continuous strand, chopped-strand, continuous mat and non-continuous mat) having a coupling agent, which will provide a suitable bond between the glass reinforcement material and resin.

D. Laminate Structure

1. The FRP laminate shall consist of a resin rich inner surface: chop-spray interior liner; and, a chop-hoop filament-wound structural exterior layer.

a. Inner surface:

(1) The resin rich inner surface shall be free of cracks and crazing with smooth finish and with an average of not over two (2) pits per square foot, providing the pits are less than 0.125 inches in diameter and 0.3125 inches in depth and are covered with sufficient resin to avoid exposure of any fiberglass reinforcement material. Some waviness shall be permissible as long as the surface is smooth. Between 0.01 to 0.02 inches of resin, rich surface shall be provided.

(2) Chop-Spray Interior Liner: The interior liner shall be reinforced by 25 to 35% by weight of chopped strand glass fiber having fiber lengths from 0.5 to 2.0 inches. The chop-spray interior liner protects the chop-hoop filament-wound structural exterior liner from corrosion damage caused by "wicking" of the wet well liquid contents. A minimum of 0.100 inches of chop-spray interior liner shall be provided.

(3) Chop-Hoop Filament-Wound Structural Exterior Layer:

(a) The structural reinforcement of the wet well shall be by the chop-hoop filament-wound manufacturing method only. The axial reinforcement shall be continuous-strand glass fiber. The longitudinal reinforcement shall be chopped-strand glass fiber. The glass fiber reinforcement content of the chop-hoop filament wound structural exterior layer shall be 50 to 80% by weight. The exterior surface of the wet well shall be relatively smooth with no exposed reinforcement fibers or sharp projections. Hand finish work is permissible to prevent reinforcement fiber exposure. The wall thickness of the chop-hoop filament-wound structural exterior layer shall vary with the wet well height to provide the aggregate strength necessary to meet the tensile and flexural physical properties requirements.

E. Physical Properties

1. Wet Well FRP Wall Laminate: The wet well FRP wall laminate must be designed to withstand wall collapse or buckling based on the following assumptions and third party specifications:

a. Hydrostatic Pressure of 62.4 lbs. per square foot
b. Saturated soil weight of 120 lbs. per cubic foot
c. Soil Modulus of 700 pounds per square foot
d. Pipe stiffness values as specified in ASTM D3753

The wet well FRP laminate must be constructed to withstand or exceed two times the assumed loading on any depth of the wet well.

F. Wet Well FRP Bottom Laminate

1. The wet well FRP bottom laminate shall have less than 0.375 inches of center elastic deflection (deformation) when in service in totally submerged conditions.

G. FRP Laminate Surface Hardness

1. The finished FRP laminate will have a Barcol Hardness of at least 90% of the resin manufacturer's specified hardness for the fully cured resin. The Barcol Hardness shall be the same for both interior and exterior surfaces.

H. Wet Well Top Flanges

1. The wet well top flanges shall have an outside diameter at least 4.0 inches greater than the inside diameter of the well.

2. A six-hole pattern shall accommodate the mounting of a cover with at least 0.375 inches in diameter 300 series stainless steel fasteners. Non-corroding stainless steel threaded inserts shall be fully encapsulated with non-continuous mat or chopped-strand glass fiber reinforcement. The inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

I. Steel Anti-Flotation Flanges

1. The steel anti-floatation flanges shall be constructed from 0.1875 inches thick ASTM A36 structural steel plate, encapsulated in at least 0.125 inches of chopped-strand glass fiber reinforcement on all sides. The steel anti-floatation flange shall be square with outside dimensions of at least 4.0 inches greater than the wet well inside diameter. The steel anti-floatation flange shall be attached to the wet well bottom with chopped-strand glass fiber reinforcement. Contractor shall place the wet well on a concrete pad and fill with grout covering the entire steel anti-floatation flange. The amount of grout shall be sufficient to prevent floatation of the wet well based on the jobsite conditions. The steel anti-floatation flange shall not require bolt holes to secure it to the concrete pad.

J. Pump Quick Disconnect Mounting Studs

1. Shall be 300 series stainless steel threaded studs of at least 0.375 inches in diameter shall be used.

2. The studs shall first be threaded into the 0.1875" inches thick ASTM A36 structural steel anti-floatation flange/bottom of the wet well and then welded into place. Once installed, the studs shall be sealed with at least two layers of non-continuous glass fiber mat or chopped-strand glass fiber reinforcement.

K. Discharge Couplings

1. A sufficient quantity and type of "Link-Seal" type modular, mechanical, inter-locking, synthetic rubber links shaped to continuously fill the annular space

between the discharge pipe and the PVC wall sleeve shall be used to provide a hydrostatic seal. The PVC sleeve shall be encapsulated in the wet well wall with non-continuous mat or chopped strand glass fiber reinforcement material.

L. Electrical Couplings

1. A 1½ inch NPT full coupling full welded in the center of an 8.0 inch by 8.0 inch 14 gauge steel plate, finished with black enamel, shall be factory installed with at least 0.250 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer.

M. Inlet Hubs

1. Thermoplastic pipe grommets shall be field installed by the Contractor in a hole in the wet well wall. The pipe grommets shall provide a mechanical seal and shall not require any secondary sealing materials. The pipe grommet diameter shall be appropriately sized by the pump station manufacturer based on the inlet piping as shown on the plans.

N. Transducer Bracket

1. Transducer bracket shall be fabricated from 300 series stainless steel with compression style cord grips to maintain transducer level position. It shall be factory installed with at least 0.250 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer.

O. Ventilation

1. Wet well ventilation shall comply with all applicable codes.

P. Slide Rail Assemblies

1. The 300 series stainless steel slide rail assemblies shall include pump quick disconnect discharge elbow, sealing flange with rail guide, upper guiderail bracket, lifting cable and guiderails.

Q. Sealing Flange with Rail Guide

1. The sealing flange with rail guide shall be mounted on each pump discharge. It shall have a machined mating flange, which matches the QDC discharge elbow. Sealing of this pump and discharge piping connection shall be accomplished by a simple linear downward motion of the pump along the guiderails culminating with the entire weight of the pumping unit supported by the QDC discharge elbow.

R. Upper Guardrail Brackets

1. The upper guiderail brackets, made from ASTM A283D 300 series stainless steel, shall align and support the two guiderails at the top of the wet well. It shall bolt directly to the hatch frame (or standard steel upper guiderail bracket in wet wells with solid fiberglass covers) and incorporate a beveled stainless steel inserts for secure rail installation.

S. Lifting Cables or Chain

1. The lifting cables or chain shall be 300 series stainless steel with a nominal breaking strength of at least 5000 pounds.

T. Guiderails

1. The guiderails shall be 2-inch schedule 40 300 series stainless steel pipe. There shall be two guiderails per pump to insure proper alignment with the QDC discharge elbow and stationary piping.

U. Solid Fiberglass Covers

1. The solid fiberglass cover shall be constructed with continuous mat or chopped strand glass fiber reinforcement with a minimum thickness of 0.325 inches. The cover shall be mounted to the wet well with six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

V. Aluminum Hatch Covers

1. The wet well (and integral valve box) cover shall be constructed of 0.250 inches thick mill finish aluminum diamond plate with 300 series stainless steel hardware. The access hatch shall have a drop handle and locking staple. The hatch shall be held open in the vertical position by means of a hold open arm of corrosion resistant design. The cover shall be mounted to the wet well (and integral valve box) with a least six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

W. Pumps and Shrouds

1. The pump station supplier shall supply the two new leachate pumps in each pump station as specified in Section 11200 Pumps complete with accessories and shall be responsible for start up services. The Pump Station Manufacturer shall coordinate all details with the pump supplier and shall be responsible for furnishing all equipment to provide functional pump stations.

2. The Pump Station Manufacturer shall furnish a 6" diameter PVC shroud

around each submersible pump in the new air stripper influent and effluent pump stations to prevent the pump motors from overheating in accordance with the pump supplier's requirements.

X. Aluminum Vertical Ladder in Valve Vaults

1. Vertical ladders shall be as manufactured by Washington Aluminum Company, Baltimore, Maryland or equal. Ladders shall have 2-1/2" x 3/8" stringers with 15/16" square non-slip rungs spaced at 12" on center. Ladders shall be aluminum alloy 6061-T6. All necessary anchor bolts will be stainless steel and furnished with ladder. All material will have a standard mil finish. The portion of the ladder in contact with concrete shall have a heavy shop coat of bituminous paint.

2. Safety Extensions: Safety extensions shall be as manufactured by Washington Aluminum Company, Baltimore, or equal. Extension poles shall be aluminum alloy 6061-T6 and castings shall be aluminum alloy 356-T6. All necessary hardware will be stainless steel and furnished with safety extensions for mounting to ladder. All material will have a standard mil finish.

Y. Pump Discharge Piping

1. Pump discharge piping shall be stainless steel pipe schedule 40S per ASTM 312/A31M Type 304 seamless, pickled and passivated with threaded, welded and/or flanged joints. Forged stainless steel flanges and threaded fittings shall be per ASTM A182/A182M Grade F304L or F316 L. Flanges shall be 125 – pound, ANSI B16.1 standard. Unions and bolts shall be Type 304 stainless steel. Gaskets shall be Johns-Manville No. 60 or equal 1/16-inch flat. Provide Teflon tape thread lubricant. Drain Piping shall be PVC pipe per Section 02533 Force main.

Z. Pump Discharge Piping Check Valves and Ball Valves

1. Check Valves shall be Danfoss Flowmatic 408SS or equal stainless steel body ball check valves with glass filled Teflon ball.

2. Both pump stations shall be equipped with two manually operated stainless steel ball valves as specified herein with a high impact polypropylene handle. The Air Stripper Influent Pump Station Valve Vault shall also be equipped with two stainless steel ball valves as specified herein with electric actuators designed to open when the corresponding pump is on and close when the corresponding pump is off as shown on the electrical drawings so the force main drains back to the pump station after each pumping cycle to prevent force main freezing. Ball valves shall be Class 150, full port flanged type stainless steel

construction, split body, ASTM A 351 Type CF8M ball and body, ASTM A276, Type 316 trim. Valve shall be equal to Nibco Figure F-515. Actuators shall be Nema 4 construction, 115 VAC using geared bi-directional motors. Valve actuators shall be suitable for operation from -40F to 140F and shall be equipped with declutchable manual override actuation with handwheel, and thermostatic 115VAC enclosure heaters. Actuators shall be Nibco Series 800 or equal.

3. End Connections: The Contractor shall verify in the valve shop drawing submittal that all valve end connections are compatible with the proposed piping furnished.

PART 3 – EXECUTION

1. LIFT STATION INSTALLATION

A. The prefabricated FRP list stations shall be installed by the Contractor according to the lift station manufacturer's published instructions.

2. FIELD QUALITY CONTROL

A. The initial startup of the prefabricated FRP lift stations shall be performed by a qualified factory representative of the lift station manufacturer. It shall be the responsibility of the factory representative to supervise the startup and instruct the owner's personnel in the proper operation and maintenance procedures for the entire prefabricated FRP lift station.

END OF SECTION

TOPP INDUSTRIES INCORPORATED
P.O. Box 420 ♦ Hwy. 25 N. ♦ Rochester, IN 46975
(800) 354-4534 ♦ Fax: (574) 223-6106

Bill of Materials

Drawing Number: 191841 | S.O. #: 191841

TAG:

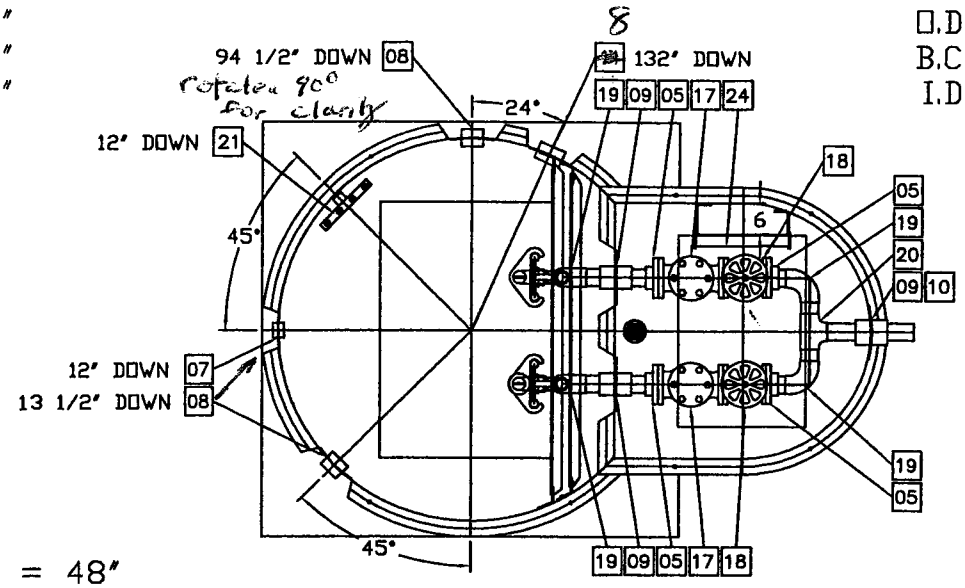
Date	Customer	P.O. # / (reference)	Pump Model	Disconnect Model	REV.
04/10/08	KAPPE ASSOCIATES INC.		GRUNDFOS 2"	SGR200	-

IT#	Qty	Part #	Description
01	01	FB72X195S	72"X 195" FIBERGLASS BASIN W/STL ANTI-FLOAT
02	01	FWVB48X72	48"X 72" ATTACHED FLATWALL VALVEBOX
03	01	SD	3/8-16 STAINLESS STEEL DUPLEX MOUNTING STUDS
04	01	C72-48FWSHA	¼" ALUMINUM HATCH COVER FOR FB72D-FWVB48
05	04	14-1102	3" SCH80 PVC VANSTONE FLANGE (SW)
06	02	17-0107	3" ALUMINUM COUPLING - WELDED IN COVER
07	01	C200S	2" SS THREADED COUPLING – ELECTRICAL
08	04 ~~02~~	C300S	3" STAINLESS STEEL THREADED COUPLING
09	03	SLV0400A48	4" ALUMINUM SLEEVE FOR 48" BASIN
10	18	LS-300-C	LS-300-C LINKSEALS
[illegible]	~~01~~	~~C400S~~	~~4" SS THREADED COUPLING~~
[illegible]	04	LL100	I.E. STEEL LIFTING LUG
[illegible]	02	SGR200-195	1 ½" OD 304 STAINLESS STEEL GUIDERAILS
14	02	SGR200VN	2" STAINLESS STEEL VERTICAL PIPE NIPPLE (2" LONG)
15	02	13-0806	2"X 3" SS BELL REDUCER
16	40'	13-0106	3" 304 STAINLESS STEEL PIPE
17	02	16-0700	3" [illegible] FLANGED BALL CHECK VALVE-FLOMATIC 408 SS (special)
18 *	02	16-0351	3" [illegible]N FLANGED [illegible]E VALVE - LEGEND STN. STL. BALL VALVE
19	04	13-0212	3" SCH40 304 STAINLESS STEEL LONG RAD. WELDED 90 ELBOW
20	01	13-0312	3" SCH40 304 STAINLESS STEEL WELDED TEE
21	01	SSFB4	STAINLESS STEEL [illegible] BRACKET W/(4) CORD GRIPS
22	01	14-8251	PVC VALVEBOX GRAVITY DRAIN
23	01	14-8104	ALUMINUM SHIPPING BRACING FOR 72" BASIN
24	01	AL12	ALUMINUM LADDER
25	01	IN00	1/4" X 3" SOLID STEEL INSPECTION PLATE W/1/4-20 BOLTS
26	02	SF70XN	2" BRASS QUICK DISCONNECT
27	02	SSLC12	3/16" 304 SS LIFTING CABLE (15' LONG) OR CHAIN
28	02	13-0204	2" STAINLESS STEEL 90 DEG. ELBOW
29	02	13-0105	2" 304 STAINLESS STEEL PIPE NIPPLE
Items To be Shipped Loose			
[illegible]	02	GV300S	3" GREEN VENT W/SS CLOSE NIPPLE
[illegible]	01	SLV0600A72	6" ALUMINUM SLEEVE FOR 72" BASIN
[illegible]	09	LS-340-C	LS-340-C LINKSEALS
Customer Supplied Material			

* Air stop [illegible]

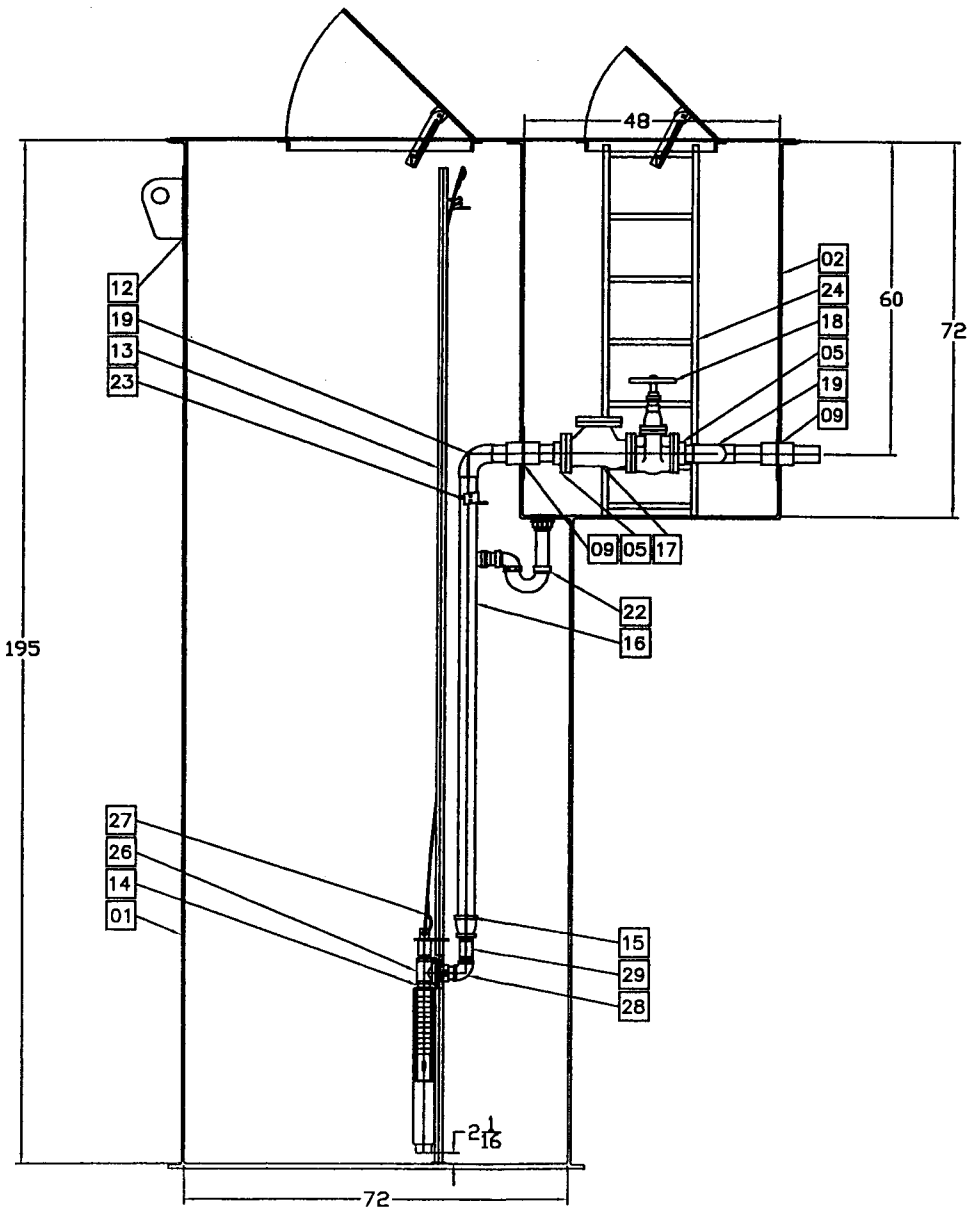
WET WELL
O.D. = 78"
B.C. = 75"
I.D. = 72"

VALVEBOX
O.D. = 54"
B.C. = 51"
I.D. = 48"



CUT DIM = 48"
SET DIM. = 9 1/4"

AIR STRIPPER EFFLUENT P.S



NO.: 191841A

O.D. = OUTER DIAMETER
I.D. = INSIDE DIAMETER
B.C. = BOLT CIRCLE
C.A. = CLEAR ACCESS

CUSTOMER: KAPPE ASSOCIATES INC.

PUMP & DISCONNECT, MODEL: GRUNDFOS 2" SGR200

SCALE:	DRAWN BY:	APP'D BY:	REV.:	DISK:
NONE	JC		-	-

DATE: 04/10/08

TOPP INDUSTRIES INCORPORATED
P: 574-223-3881
F: 574-223-8108

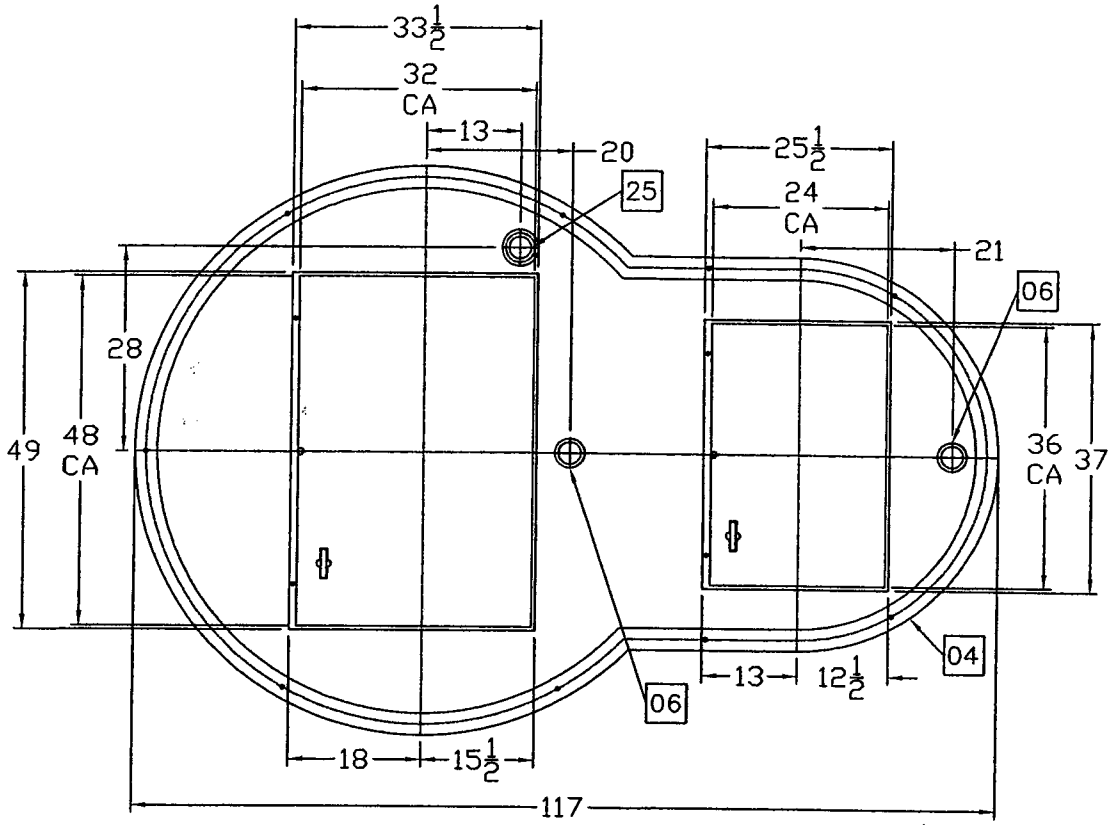
SO No: 191841

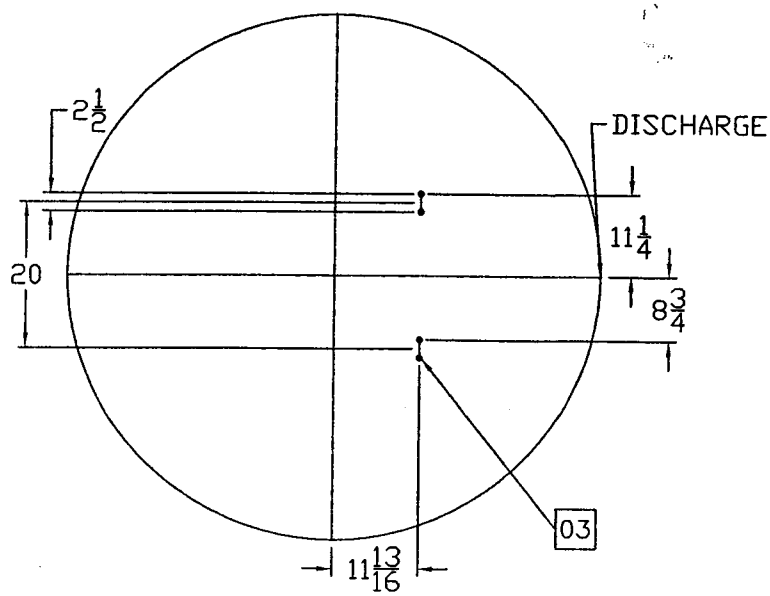
PO No: -

NO:	DATE:	
1	-	-
2	-	-
3	-	First Released.

COVER
WET WELL
O.D. = 78″
B.C. = 75″
I.D. = 72″

COVER
VALVEBOX
O.D. = 54″
B.C. = 51″
I.D. = 48″





NO.: 191841B

D.D. = OUTER DIAMETER
I.D. = INSIDE DIAMETER
B.C. = BOLT CIRCLE
C.A. = CLEAR ACCESS

CUSTOMER: KAPPE ASSOCIATES INC.

PUMP & DISCONNECT, MODEL: GRUNDFOS 2 SGR200

PO No: —

SO No: 191841

DATE: 04/10/08 | APP'D BY: | REV.: — | DISK: —

SCALE: NONE | DRAWN BY: JC

TOPP INDUSTRIES INCORPORATED

TOPP INDUSTRIES
P: 574-223-3681
F: 574-223-6106

NO:	DATE:	
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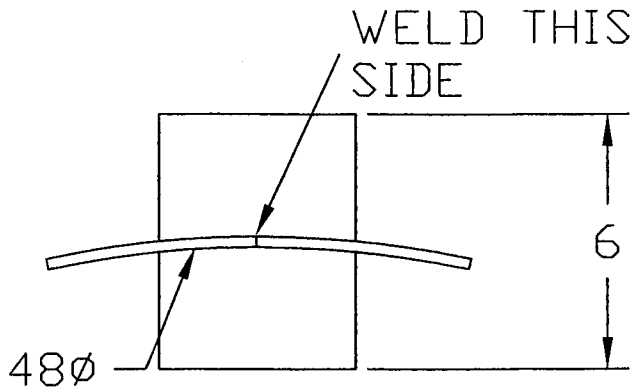

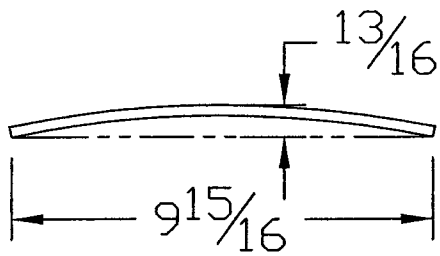

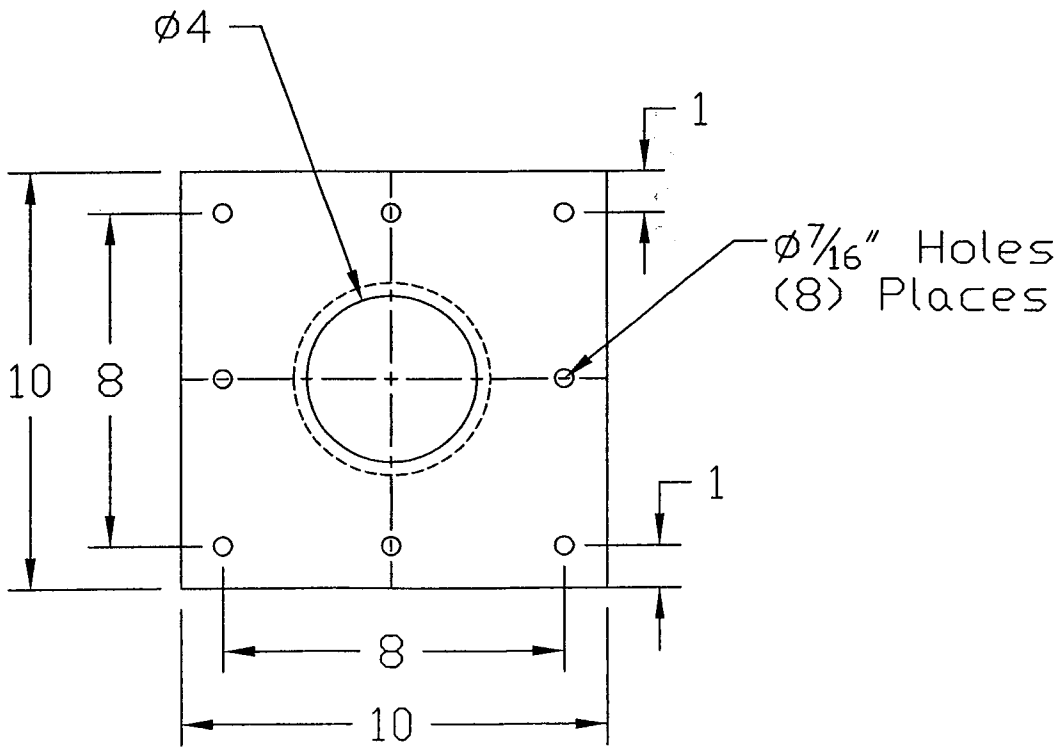

1 PART

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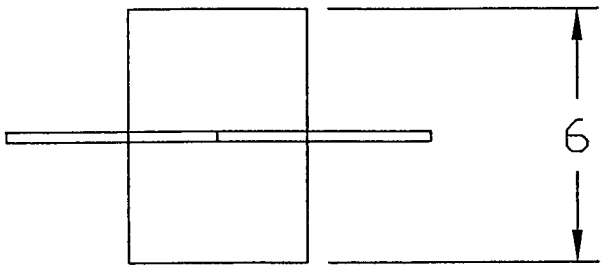
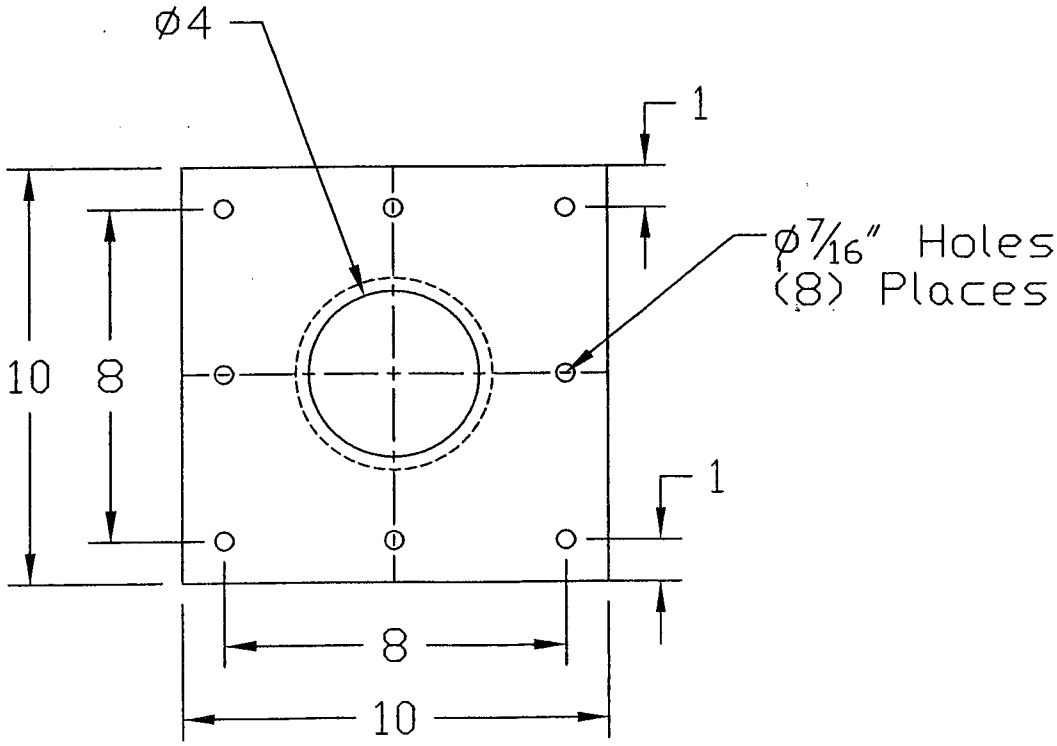
4" Aluminum Sleeve For 2" PVC or Galv. w/ (6) LS-300-C Linkseals	MATERIAL: 1/4" Thick Diamond Plate Aluminum	SO No: 191841	A –	–	
	DATE: 04/10/08 APP'D BY: REV.: –	TOPP INDUSTRIES	A –	–	
	SCALE: NONE DRAWN BY: JC DISK:	P: 574-223-3681 F: 574-223-8106	NO: DATE:		





2 PARTS

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4" Aluminum Sleeve For 2" PVC or Galv. w/ (6) LS-300-C Linkseals	MATERIAL: 1/4" Thick Diamond Plate Aluminum		SO No: 191841	⚠	–	–	
	DATE: 04/10/08	APP'D BY:	REV.: –	⚠	–	–	
	SCALE: NONE	DRAWN BY: JC	DISK:	TOPP INDUSTRIES INCORPORATED	TOPP INDUSTRIES P: 574-223-3681 F: 574-223-6106	NO:	DATE: